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EUROPEAN PATENT APPLICATION

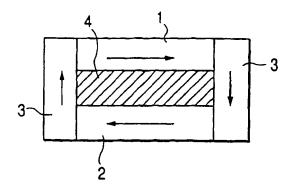
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- (54) Magnetic thin-film memory element utilizing GMR effect, and magnetic thin-film memory
- (57) A magnetic memory element comprising a first magnetic layer magnetized in an orientation of magnetization along one in-plane direction, a second magnetic layer magnetized in an orientation of magnetization parallel or antiparallel to the orientation of magnetization of the first magnetic layer, the second magnetic layer hav-

ing a higher coercive force than that of the first magnetic layer, a non-magnetic layer interposed between the first magnetic layer and the second magnetic layer, and a third magnetic layer for magnetically coupling the first magnetic layer with the second magnetic layer in order to form a closed magnetic circuit with the first magnetic layer and the second magnetic layer.

FIG. 4



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EUROPEAN SEARCH REPORT

Application Number

EP 98 30 3254

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category			Relevant to claim	CLASSIF CATION OF THE APPLICATION (Inl.Cl.6)	
X	WO 96 25740 A (INTEGRATED MICROTRANSDUCER ELE) 22 August 1996 (1996-08-22) * page 16, line 32 - page 18, line 12; figure 5 *		1	G11C11/15	
X	22 December 1992 (* column 4, line 1	1992-12-22) 1 - column 5, line 5:	1		
L NO CAN NER LYV	: <u>09/781,17</u> T: <u>Schwarz</u> AND GREEN P.O. BOX 248 /OOD, FLCRI	73 L & D. NBERG P.A. 80 DA 33022		TECHNICAL FIELDS SEARCHED (Int.Cl.6) G11C	
The present search report has been drawn up for all claims					
		Date of completion of the search		Examiner	
		9 September 1999	Beas	sley-Suffolk, D	
THE HAGUE CATEGORY OF CITED DOCUMENTS X perticularly relevant if taken alone Y perticularly relevant if combined with another document of the same category A: technological background C non-written dissolutive P: intermediate document		E earlier patent doc after the filing dat her D : document cated in L document cated for	T theory or principle underlying the invention E earlier patient document, but published on, or after the filing date D: document cated in the application L document cated for other reasons å: member of the same patent family, corresponding document		
	X X X X X X X X X X X X X X X X X X X	Category Citation of document with of relevant pass X WO 96 25740 A (INT ELE) 22 August 199 * page 16, line 32 figure 5 * X US 5 173 873 A (WU 22 December 1992 (* column 4, line 1 figures 3A, 3B, 3C * The present search report has PACE 3' search PO. BOX 240 LYVOOD, FLORI TEL. (954) 925 The HAGUE CATEGORY relevant if taken alone with another particularly relevant if combined with another particularly relevant of combined or particularly relevant of the same particularl	Category Clation of document with indication, where approcriate, of relevant passages WO 96 25740 A (INTEGRATED MICROTRANSDUCER ELE) 22 August 1996 (1996-08-22) * page 16, 1 ine 32 - page 18, 1 ine 12; figure 5 * X US 5 173 873 A (WU JIIN-CHUAN ET AL) 22 December 1992 (1992-12-22) * column 4, 1 ine 11 - column 5, 1 ine 5; figures 3A, 3B, 3C * TNO: GR 98 P 23/4P NO: O9/78/, 173 CANT: Schwarzletal. NER AND GREENBERG P.A. P.O. BOX 2480 LYV/OOD, FLORIDA 33022 TEL. (954) 925-1100 The present search report has been drawn up for all claims Place of search THE HAGUE 9 September 1999 CATEGORY OF CITED DOCUMENTS X perioularly relevant if somblined with another document clasted in document c	Category Catalon of document with indication, where approcriate. of relevant passages X W0 96 25740 A (INTEGRATED MICROTRANSDUCER ELE) 22 August 1996 (1996-08-22) * page 16, line 32 - page 18, line 12; figure 5 * X US 5 173 873 A (WU JIIN-CHUAN ET AL) 22 December 1992 (1992-12-22) * column 4, line 11 - column 5, line 5; figures 3A,3B,3C * T NO: GR 98 P 23/4P NO: O9/78 / /73 CANT: Schwarzletal. NER AND GREENBERG P.A. P.O. BOX 2480 LYWOOD, FLORIDA 33022 TEL. (954) 925-1100 The present search report has been drawn up for all claims Place if search Place if search The HAGUE A CATEGORY OF CITED DOCUMENTS X peritoclarly relevant of combined with another Y peritoclarly relevant of sombined with another Y peritoclarly relevant of combined with another Y peritoclarly relevant of sombined with another Y peritoclarly relevant of combined with another Y peritoclarly relevant of the combined with another Y peri	